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MEMORANDUM

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TO: Distribution List

FROM: Robert Oberthaler, Manager
Water Quality Standards
Office of Environmental Planning

SUBJECT: Surface Water Quality Standards
Criteria Currently Applicable to New Jersey Surface Waters

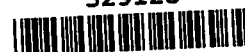
DATE: June 29, 1995

Attached is a table, Surface Water Quality Criteria Applicable To New Jersey, which lists criteria currently applicable to New Jersey surface waters for toxic pollutants. The criteria reflect the more stringent of the New Jersey adopted criteria (25 N.J.R. 5569, December 6, 1993) and the USEPA adopted criteria (Fed. Reg. Vol. 57, No. 246-60848, December 22, 1992 and Fed. Reg. Vol. 60, No. 86-22228, May 4, 1995). The Office of Environmental Planning is providing this revised table of applicable criteria to reflect the adoption of revised aquatic criteria for eight metals by the USEPA. The Office Environmental Planning will in the future provide a revised table of applicable criteria when the USEPA approves the criteria adopted by New Jersey and repeals the corresponding USEPA adopted criteria. Additionally, revised tables will be issued as needed to reflect future criteria adoptions by either the USEPA or NJDEP.

For criteria for pollutants other than toxics, please refer to N.J.A.C. 7:9B or you may contact the Surface Water Quality Standards (SWQS) program, Office of Environmental Planning, at the number referenced below.

If you need copies of the SWQS or have any questions regarding SWQS, please call Steven Lubow at (609) 633-1179.

Attachment



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SURFACE WATER QUALITY CRITERIA APPLICABLE TO NEW JERSEY

(µg/L unless otherwise noted)

Toxic Substance	Freshwater Criteria			Saltwater Criteria		
	Aquatic		Human Health	Aquatic		Human Health
	Acute	Chronic		Acute	Chronic	
Acrolein			320(h) _{NJ}			780(h) _{NJ}
Acrylonitrile			0.059(hc) _{EPA}			0.66(hc) _{EPA}
Aldrin	3.0 _{NJ}		0.00013(hc) _{EPA}	1.3 _{NJ}		0.00014(hc) _{EPA}
Ammonia, un-ionized (24-hr. average)		20 _{NJ} 50 _{NJ}			0.1 (LC ₅₀ or EC ₅₀) _{NJ}	
Anthracene			9,570(h) _{NJ}			108,000(h) _{NJ}
Antimony			12.2(h) _{NJ}			4,300(h) _{NJ}
Arsenic	360(d) _{EPA}	190(d) _{EPA}	0.0170(hc) _{NJ}	69(d) _{EPA}	36(d) _{EPA}	0.136(hc) _{NJ}
Asbestos			7 million fibers/L(h) _{NJ}			
Barium			2,000(h) _{NJ}			
Benz(a)anthracene			0.0028(hc) _{NJ}			0.031(hc) _{NJ}
Benzene			0.150(hc) _{NJ}			71(hc) _{NJ}
Benzidine			0.000118(hc) _{NJ}			0.000535(hc) _{NJ}
3,4-Benzofluoranthene (Benzo(b)fluoranthene)			0.0028(hc) _{NJ}			0.031(hc) _{NJ}
Benzo(a)pyrene (BaP)			0.0028(hc) _{NJ}			0.031(hc) _{NJ}
Benzo(k)fluoranthene			0.0028(hc) _{NJ}			0.031(hc) _{NJ}
alpha-BHC (alpha-HCH)			0.0039(hc) _{EPA}			0.013(hc) _{EPA}
beta-BHC (beta-HCH)			0.137(hc) _{NJ}			0.460(hc) _{NJ}
gamma-BHC (gamma- HCH/Lindane)	2.0 _{NJ}	0.080 _{NJ}	0.19(hc) _{EPA}	0.16 _{NJ}		0.63(hc) _{EPA}
Bis(2-chloroethyl) ether			0.031(hc) _{EPA}			1.4(hc) _{NJ}
Bis(2-chloroisopropyl) ether			1,250(h) _{NJ}			170,000(h) _{NJ}
Bis(2-ethylhexyl) phthalate			1.76(hc) _{NJ}			5.9(hc) _{EPA}
Bromodichloromethane (Dichlorobromomethane)			0.266(hc) _{NJ}			22(hc) _{NJ}
Bromoform			4.3(hc) _{EPA}			360(hc) _{NJ}
Butyl benzyl phthalate			239(h) _{NJ}			416(h) _{NJ}
Cadmium	3.7(a) _{EPA}	1.0(a) _{EPA}	10(h) _{NJ}	42(d) _{EPA}	9.3(d) _{EPA}	
Carbon tetrachloride			0.25(hc) _{EPA}			4.4(hc) _{EPA}
Chlordane	2.4 _{NJ}	0.0043 _{NJ}	0.000277(hc) _{NJ}	0.09 _{NJ}	0.0040 _{NJ}	0.000283(hc) _{NJ}
Chloride	860,000 _{NJ}	230,000 _{NJ}	250,000(ol) _{NJ}			
Chlorine Produced Oxidants	19 _{NJ}	11 _{NJ}		13 _{NJ}	7.5 _{NJ}	

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(µg/L unless otherwise noted)

Toxic Substance	Freshwater Criteria			Saltwater Criteria		
	Aquatic		Human Health	Aquatic		Human Health
	Acute	Chronic		Acute	Chronic	
Chlorobenzene			22.0(h) _{NJ}			21,000(h) _{NJ}
Chloroform			5.67(hc) _{NJ}			470(hc) _{NJ}
2-Chlorophenol			122(h) _{NJ}			402(h) _{NJ}
Chlorpyrifos	0.083 _{NJ}	0.041 _{NJ}		0.011 _{NJ}	0.0056 _{NJ}	
Chromium			160(h) _{4NJ}			3,230(h) _{4NJ}
Chromium ⁺³	550(a) _{OEPA}	180(a) _{OEPA}				
Chromium ⁺⁶	15(d) _{OEPA}	10(d) _{OEPA}		1,100(d) _{OEPA}	50(d) _{OEPA}	
Chrysene			0.0028(hc) _{NJ}			0.031(hc) _{NJ}
Copper	17(a) _{OEPA}	11(a) _{OEPA}		2.4(d) _{OEPA}	2.4(d) _{OEPA}	
Cyanide	22 _{NJ}	5.2 _{NJ}	700(h) _{EPA}	1.0 _{NJ}	1.0 _{NJ}	220,000(h) _{NJ}
4,4'-DDD (p,p'-TDE)			0.00083(hc) _{EPA}			0.000837(hc) _{NJ}
4,4'-DDE			0.000588(hc) _{NJ}			0.00059(hc) _{EPA}
4,4'-DDT	1.1 _{NJ}	0.0010 _{NJ}	0.000588(hc) _{NJ}	0.13 _{NJ}	0.0010 _{NJ}	0.00059(hc) _{EPA}
Demeton		0.1 _{NJ}			0.1 _{NJ}	
Dibenz(a,h)anthracene			0.0028(hc) _{NJ}			0.031(hc) _{NJ}
Dibromochloromethane (Chlorodibromomethane)			72.6(h) _{NJ} 4.1(hc) _{EPA}			340(hc) _{EPA}
Di-n-butyl phthalate			2,700(h) _{EPA}			12,000(h) _{EPA}
1,2-Dichlorobenzene			2,520(h) _{NJ}			16,500(h) _{NJ}
1,3-Dichlorobenzene			400(h) _{EPA}			2,600(h) _{EPA}
1,4-Dichlorobenzene			343(h) _{NJ}			2,600(h) _{EPA}
3,3'-Dichlorobenzidine			0.0386(hc) _{NJ}			0.0767(hc) _{NJ}
1,2-Dichloroethane			0.291(hc) _{NJ}			99(hc) _{NJ}
1,1-Dichloroethylene			4.81(h) _{NJ} 0.57(hc) _{EPA}			32(hc) _{EPA}
trans-1,2-Dichloroethylene			592(h) _{NJ}			
2,4-Dichlorophenol			92.7(h) _{NJ}			790(h) _{EPA}
1,3-Dichloropropene (cis and trans)			0.193(hc) _{NJ} 10(h) _{EPA}			1,700(h) _{NJ}
Dieldrin	2.5 _{NJ}	0.0019 _{NJ}	0.000135(hc) _{NJ}	0.71 _{NJ}	0.0019 _{NJ}	0.00014(hc) _{EPA}
Diethyl phthalate			21,200(h) _{NJ}			111,000(h) _{NJ}
Dimethyl phthalate			313,000(h) _{NJ}			2,900,000(h) _{NJ}
4,6-Dinitro-o-cresol			13.4(h) _{NJ}			765(h) _{NJ}

SURFACE WATER QUALITY CRITERIA APPLICABLE TO NEW JERSEY

(µg/L unless otherwise noted)

Toxic Substance	Freshwater Criteria			Saltwater Criteria		
	Aquatic		Human Health	Aquatic		Human Health
	Acute	Chronic		Acute	Chronic	
2,4-Dinitrophenol			89.7(h) _{NJ}			14,000(h) _{NJ}
2,4-Dinitrotoluene			0.11(hc) _{NJ}			9.1(hc) _{NJ}
1,2-Diphenylhydrazine			0.040(hc) _{EPA}			0.54(hc) _{EPA}
Endosulfans (alpha and beta)	0.22 _{NJ}	0.056 _{NJ}	0.932(h) _{NJ}	0.034 _{NJ}	0.0087 _{NJ}	1.99(h) _{NJ}
alpha-Endosulfan			0.93(h) _{EPA}			
beta-Endosulfan			0.93(h) _{EPA}			
Endosulfan sulfate			0.93(h) _{NJ}			2.0(h) _{NJ}
Endrin	0.18 _{NJ}	0.0023 _{NJ}	0.629(h) _{NJ}	0.037 _{NJ}	0.0023 _{NJ}	0.678(h) _{NJ}
Endrin aldehyde			0.76(h) _{NJ}			0.81(h) _{NJ}
Ethylbenzene			3,030(h) _{NJ}			27,900(h) _{NJ}
Fluoranthene			300(h) _{EPA}			370(h) _{EPA}
Fluorene			1,300(h) _{EPA}			14,000(h) _{EPA}
Guthion		0.01 _{NJ}			0.01 _{NJ}	
Heptachlor	0.52 _{NJ}	0.0038 _{NJ}	0.000208(hc) _{NJ}	0.053 _{NJ}	0.0036 _{NJ}	0.00021(hc) _{EPA}
Heptachlor epoxide	0.52 _{NJ}	0.0038 _{NJ}	0.00010(hc) _{EPA}	0.053 _{NJ}	0.0036 _{NJ}	0.000106(hc) _{NJ}
Hexachlorobenzene			0.000748(hc) _{NJ}			0.00077(hc) _{EPA}
Hexachlorobutadiene			6.94(h) _{NJ} 4.4(hc) _{EPA}			500(hc) _{EPA}
Hexachlorocyclopentadiene			240(h) _{EPA}			17,000(h) _{NJ}
Hexachloroethane			2.73(h) _{NJ} 19(hc) _{EPA}			12.4(h) _{NJ} 89(hc) _{EPA}
Indeno(1,2,3-cd)pyrene			0.0028(hc) _{NJ}			0.031(hc) _{NJ}
Isophorone			552(h) _{NJ} 84(hc) _{EPA}			6,000(hc) _{EPA}
Lead	65(a) _{O EPA}	2.5(a) _{O EPA}	5.0(h) _{Δ NJ}	210(d) _{O EPA}	8.1(d) _{O EPA}	
Malathion		0.1 _{NJ}			0.1 _{NJ}	
Manganese						100(h) _{Δ NJ}
Mercury	2.1(d) _{O EPA}	0.012(c) _{Δ EPA}	0.14(h) _{Δ EPA}	1.8(d) _{O EPA}	0.025(c) _{Δ EPA}	0.146(h) _{Δ NJ}
Methoxychlor		0.03 _{NJ}	40(h) _{NJ}		0.03 _{NJ}	
Methyl bromide (bromomethane)			48(h) _{EPA}			4,000(h) _{NJ}
Methylene chloride			2.49(hc) _{NJ}			1,600(hc) _{NJ}
Mirex		0.001 _{NJ}			0.001 _{NJ}	

SURFACE WATER QUALITY CRITERIA APPLICABLE TO NEW JERSEY

(µg/L unless otherwise noted)

Toxic Substance	Freshwater Criteria			Saltwater Criteria		
	Aquatic		Human Health	Aquatic		Human Health
	Acute	Chronic		Acute	Chronic	
Nickel	1,400(a) <small>OEPA</small>	160(a) <small>OEPA</small>	516(h) <small>ΔNJ</small>	74(d) <small>OEPA</small>	8.2(d) <small>OEPA</small>	3,900(h) <small>ΔNJ</small>
Nitrate (as N)			10,000(h) <small>NJ</small>			
Nitrobenzene			16.0(h) <small>NJ</small>			1,900(h) <small>NJ</small>
N-Nitrosodi-n-butylamine			0.00641(hc) <small>NJ</small>			
N-Nitrosodiethylamine			0.000233(hc) <small>NJ</small>			
N-Nitrosodimethylamine			0.000686(hc) <small>NJ</small>			8.1(hc) <small>NJ</small>
N-Nitrosodiphenylamine			4.95(hc) <small>NJ</small>			16(hc) <small>EPA</small>
N-Nitrosopyrrolidine			0.0167(hc) <small>NJ</small>			
Parathion	0.065 <small>NJ</small>	0.013 <small>NJ</small>				
Pentachlorobenzene			3.67(h) <small>NJ</small>			4.21(h) <small>NJ</small>
Pentachlorophenol	20(b) <small>NJ</small>	13(b) <small>NJ</small>	0.28(hc) <small>EPA</small>	13 <small>NJ</small>	7.9 <small>NJ</small>	8.2(hc) <small>NJ</small>
Phenol			20,900(h) <small>NJ</small>			4,600,000(h) <small>NJ</small>
Phosphorous (yellow)					0.1 <small>NJ</small>	
Polychlorinated biphenyls (PCBs)		0.014 <small>NJ</small>	0.000244(hc) <small>NJ</small>		0.030 <small>NJ</small>	0.000247(hc) <small>NJ</small>
PCB-1242			0.000044(hc) <small>EPA</small>			0.000045(hc) <small>EPA</small>
PCB-1254			0.000044(hc) <small>EPA</small>			0.000045(hc) <small>EPA</small>
PCB-1221			0.000044(hc) <small>EPA</small>			0.000045(hc) <small>EPA</small>
PCB-1232			0.000044(hc) <small>EPA</small>			0.000045(hc) <small>EPA</small>
PCB-1248			0.000044(hc) <small>EPA</small>			0.000045(hc) <small>EPA</small>
PCB-1260			0.000044(hc) <small>EPA</small>			0.000045(hc) <small>EPA</small>
PCB-1016			0.000044(hc) <small>EPA</small>			0.000045(hc) <small>EPA</small>
Pyrene			797(h) <small>NJ</small>			8,970(h) <small>NJ</small>
Selenium	20 <small>ΔEPA</small>	5.0 <small>ΔEPA</small>	10(h) <small>ΔNJ</small>	290(d) <small>OEPA</small>	71(d) <small>OEPA</small>	
Silver	3.4(a) <small>OEPA</small>		164(h) <small>ΔNJ</small>	1.9(d) <small>OEPA</small>		
Sulfide-hydrogen sulfide (undissociated)		2 <small>NJ</small>			2 <small>NJ</small>	
1,2,4,5-Tetrachlorobenzene			2.56(h) <small>NJ</small>			3.25(h) <small>NJ</small>
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)			0.00000013(hc) <small>NJ</small>			0.00000014(hc) <small>NJ</small>
1,1,2,2-Tetrachloroethane			1.7(hc) <small>EPA</small>			110(hc) <small>EPA</small>
Tetrachloroethylene			0.388(hc) <small>NJ</small>			4.29(hc) <small>NJ</small>
Thallium			1.70(h) <small>ΔNJ</small>			6.22(h) <small>ΔNJ</small>

SURFACE WATER QUALITY CRITERIA APPLICABLE TO NEW JERSEY

(µg/L unless otherwise noted)

Toxic Substance	Freshwater Criteria			Saltwater Criteria		
	Aquatic		Human Health	Aquatic		Human Health
	Acute	Chronic		Acute	Chronic	
Toluene			6,800(h) _{EPA}			200,000(h) _{NJ}
Toxaphene	0.73 _{NJ}	0.0002 _{NJ}	0.000730(hc) _{NJ}	0.21 _{NJ}	0.0002 _{NJ}	0.000747(hc) _{NJ}
1,2,4-Trichlorobenzene			30.6(h) _{NJ}			113(h) _{NJ}
1,1,1-Trichloroethane			127(h) _{NJ}			
1,1,2-Trichloroethane			13.5(h) _{NJ} 6.0(hc) _{EPA}			420(hc) _{EPA}
Trichloroethylene			1.09(hc) _{NJ}			81(hc) _{NJ}
2,4,5-Trichlorophenol			2,580(h) _{NJ}			9,790(h) _{NJ}
2,4,6-Trichlorophenol			2.1(hc) _{EPA}			6.5(hc) _{EPA}
Vinyl chloride			0.0830(hc) _{NJ}			525(hc) _{NJ}
Zinc	110(a) _{O EPA}	100(a) _{O EPA}		90(d) _{O EPA}	81(d) _{O EPA}	

- a Criteria for these metals are expressed by equations which follow. Criteria in the table are at total hardness of 100 mg/L of CaCO₃. Criteria can be calculated for any hardness using the following equations. Criteria listed above are multiplied by appropriate conversion factors (CF) and by the default water effect ratio (WER) of 1.0.

$$\text{Acute criterion} = \text{WER} \times e^{(m_A \{\ln(\text{hardness})\} + b_A)} \times \text{acute CF}$$

$$\text{Chronic criterion} = \text{WER} \times e^{(m_C \{\ln(\text{hardness})\} + b_C)} \times \text{chronic CF}$$

Factors for use in the formulae are:

	m_A	b_A	m_C	b_C	Acute CF	Chronic CF
Cadmium	1.128	-3.828	0.7852	-3.490	0.944 [@]	0.909 [@]
Copper	0.9422	-1.464	0.8545	-1.465	0.960	0.960
Chromium ⁺³	0.8190	3.688	0.8190	1.561	0.316	0.860
Lead	1.273	-1.460	1.273	-4.705	0.791 [@]	0.791 [@]
Nickel	0.8460	3.3612	0.8460	1.1645	0.998	0.997
Silver	1.72	-6.52	-	-	0.85	-
Zinc	0.8473	0.8604	0.8473	0.7614	0.978	0.986

- [@] The freshwater CF for cadmium and lead are hardness dependent. Conversion factors listed above for cadmium and lead are at total hardness of 100 mg/L of CaCO₃. Conversion factors for cadmium and lead can be calculated for any hardness using the following equations:

Cadmium

$$\text{Acute: CF} = 1.1366 - [(\ln \text{ hardness})(0.0418)]$$

$$\text{Chronic: CF} = 1.1016 - [(\ln \text{ hardness})(0.0418)]$$

Lead

$$\text{Acute \& Chronic: CF} = 1.4620 - [(\ln \text{ hardness})(0.1457)]$$

SURFACE WATER QUALITY CRITERIA APPLICABLE TO NEW JERSEY

- b Criteria are expressed by the equations which follow. Criteria in the table are at pH of 7.8.
Acute criterion = $e^{(1.005(\text{pH})-4.830)}$
Chronic criterion = $e^{(1.005(\text{pH})-5.290)}$
- c If the chronic criterion for total mercury exceeds 0.012 µg/L, the edible portion of aquatic species of concern must be analyzed to determine whether additional actions are required.
- d Criteria for these metals are expressed as a function of the WER
- h Noncarcinogenic effect-based human health criteria
- hc Human carcinogenic effect-based human health criteria
- ol Organoleptic effect-based criteria expressed as maximum concentrations
- ♦ Criteria for FW2-TP & FW2-TM waters
 - ♦♦ Criteria for FW2-NT waters
 - o Criteria expressed as dissolved
 - ▲ Criteria expressed as total recoverable